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(54) **METHODS OF PROVIDING THERAPEUTIC EFFECTS USING CYCLOSPORIN COMPONENTS**

(71) Applicant: **Allergan, Inc.**, Irvine, CA (US)

(72) Inventors: **Andrew Acheampong**, Irvine, CA (US); **Diane D. Tang-Liu**, Las Vegas, NV (US); **James N. Chang**, Newport Beach, CA (US); **David F. Power**, Hubert, NC (US)

(73) Assignee: **Allergan, Inc.**, Irvine, CA (US)

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(52) **U.S. Cl.**

USPC **514/20.5**

(58) **Field of Classification Search**

CPC A61K 38/13; A61K 9/0048
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | |
|-------------|---------|--------------------|
| 3,278,447 A | 10/1966 | McNicholas |
| 4,388,229 A | 6/1983 | Fu |
| 4,388,307 A | 6/1983 | Cavanak |
| 4,614,736 A | 9/1986 | Delevallee et al. |
| 4,649,047 A | 3/1987 | Kaswan |
| 4,764,503 A | 8/1988 | Wenger |
| 4,814,323 A | 3/1989 | Andrieu et al. |
| 4,839,342 A | 6/1989 | Kaswan |
| 4,970,076 A | 11/1990 | Horrobin |
| 4,990,337 A | 2/1991 | Kurihara et al. |
| 4,996,193 A | 2/1991 | Hewitt et al. |
| 5,047,396 A | 9/1991 | Orban et al. |
| 5,051,402 A | 9/1991 | Kurihara et al. |
| 5,053,000 A | 10/1991 | Booth et al. |
| 5,286,730 A | 2/1994 | Caufield et al. |
| 5,286,731 A | 2/1994 | Caufield et al. |
| 5,294,604 A | 3/1994 | Nussenblatt et al. |

| | | |
|-------------|---------|------------------|
| 5,296,158 A | 3/1994 | MacGilp et al. |
| 5,342,625 A | 8/1994 | Hauer et al. |
| 5,368,854 A | 11/1994 | Rennick |
| 5,411,952 A | 5/1995 | Kaswan |
| 5,424,078 A | 6/1995 | Dziabo |
| 5,474,919 A | 12/1995 | Chartrain et al. |
| 5,474,979 A | 12/1995 | Ding et al. |
| 5,504,068 A | 4/1996 | Komiya et al. |
| 5,540,931 A | 7/1996 | Hewitt et al. |
| 5,543,393 A | 8/1996 | Kim et al. |
| 5,589,455 A | 12/1996 | Woo |
| 5,591,971 A | 1/1997 | Shahar et al. |
| 5,614,491 A | 3/1997 | Walch et al. |
| 5,639,724 A | 6/1997 | Cavanak |
| 5,652,212 A | 7/1997 | Cavanak et al. |
| 5,719,123 A | 2/1998 | Morley et al. |
| 5,739,105 A | 4/1998 | Kim et al. |
| 5,753,166 A | 5/1998 | Dalton et al. |
| 5,766,629 A | 6/1998 | Cho et al. |
| 5,798,333 A | 8/1998 | Sherman |
| 5,807,820 A | 9/1998 | Elias et al. |
| 5,827,822 A | 10/1998 | Floch'h et al. |
| 5,827,862 A | 10/1998 | Yamamura |
| 5,834,017 A | 11/1998 | Cho et al. |
| 5,843,452 A | 12/1998 | Wiedmann et al. |
| 5,843,891 A | 12/1998 | Sherman |
| 5,858,401 A | 1/1999 | Bhalani et al. |

(Continued)

FOREIGN PATENT DOCUMENTS

| | | |
|----|----------|--------|
| DE | 19810655 | 9/1999 |
| EP | 0471293 | 2/1992 |

(Continued)

OTHER PUBLICATIONS

Abdulrazik, M. et al, Ocular Delivery of Cyclosporin A II. Effect of Submicron Emulsion's Surface Charge on Ocular Distribution of Topical Cyclosporin A, S.T.P. Pharma Sciences, Dec. 2001, 427-432, 11(6).

Acheampong, Andrew et al, Cyclosporine Distribution into the Conjunctiva, Cornea, Lacrimal Gland and Systemic Blood Following Topical Dosing of Cyclosporine to Rabbit, Dog and Human eyes, 1996, 179.

Acheampong, Andrew et al, Cyclosporine Distribution Into The Conjunctiva, Cornea, Lacrimal Gland, and Systemic Blood Following Topical Dosing of Cyclosporine to Rabbit, Dog, and Human Eyes, Adv. Exp. Med. Biol., 1998, 1001-1004, 438.

Acheampong, Andrew et al, Distribution of Cyclosporin A in Ocular Tissues After Topical Administration to Albino Rabbits and Beagle Dogs, Current Eye Research, 1999, 91-103, 18(2).

Akpek, Esen Karamursel et al, A Randomized Trial of Topical Cyclosporin 0.05% in Topical Steroid-Resistant Atopic Keratoconjunctivitis, Ophthalmology, 2004, 476-482, 111.

Angelov, O. et al, Preclinical Safety Studies of Cyclosporine Ophthalmic Emulsion, Adv Exp Med Biol, 1998, 991-995, 438.

(Continued)

Primary Examiner — Marcela M Cordero Garcia

(74) Attorney, Agent, or Firm — Laura L. Wine; Joel B. German

(57) **ABSTRACT**

Methods of treating an eye of a human or animal include administering to an eye of a human or animal a composition in the form of an emulsion including water, a hydrophobic component and a cyclosporin component in a therapeutically effective amount of less than 0.1% by weight of the composition. The weight ratio of the cyclosporin component to the hydrophobic component is less than 0.8.

20 Claims, No Drawings